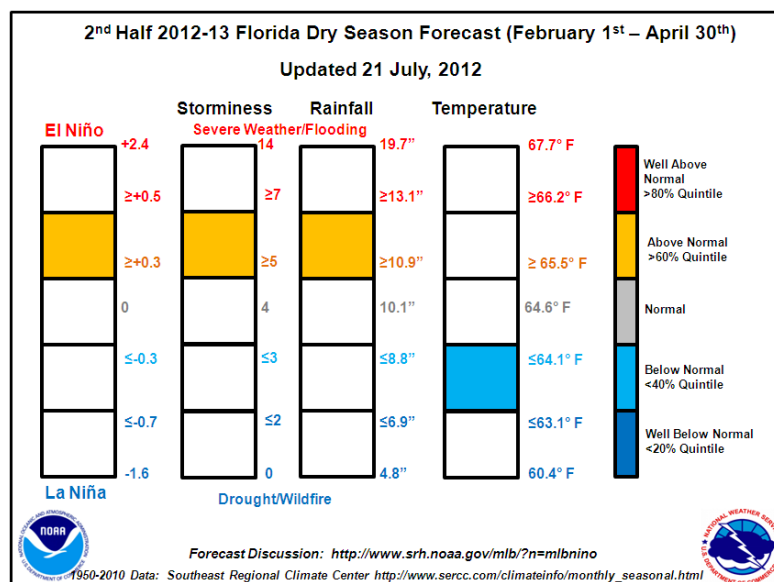
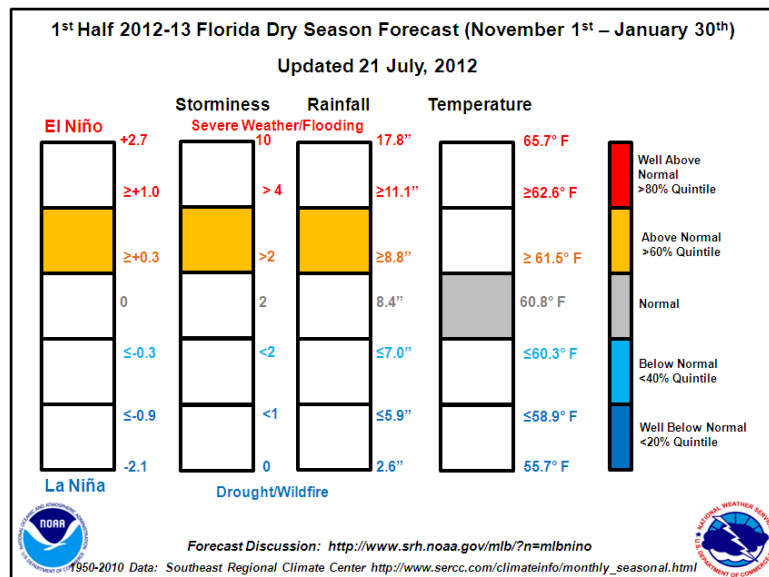


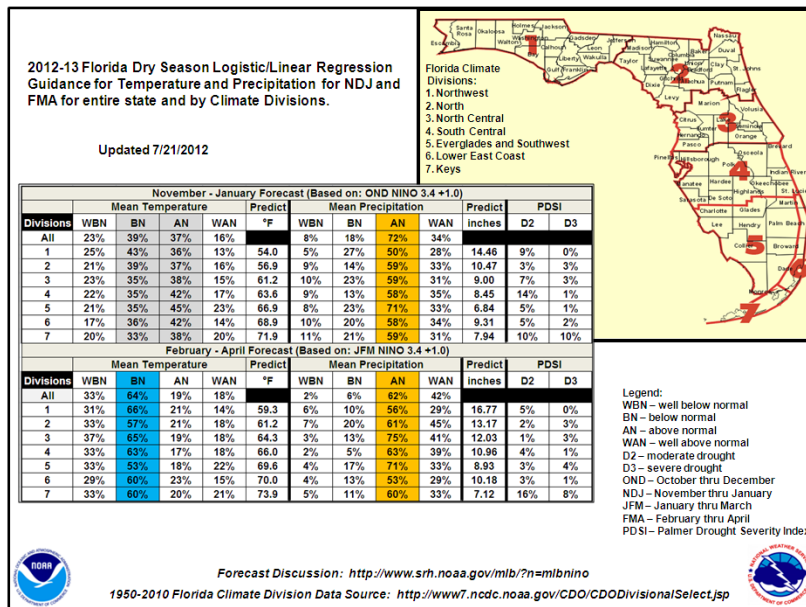


# 2012 – 2013 Dry Season Forecast for Florida

(Valid for period of November 1<sup>st</sup> – April 30<sup>th</sup>)



The latest statewide dry season forecast for storminess, rainfall and temperature. [How to interpret these forecast charts.](#)



Logistic and linear regression guidance provided for the entire state of Florida and each of the seven climate divisions. Guidance has been provided for temperature, precipitation and the Palmer Drought Severity Index (PDSI) for NDJ and FMA. [How to interpret these forecast charts.](#)

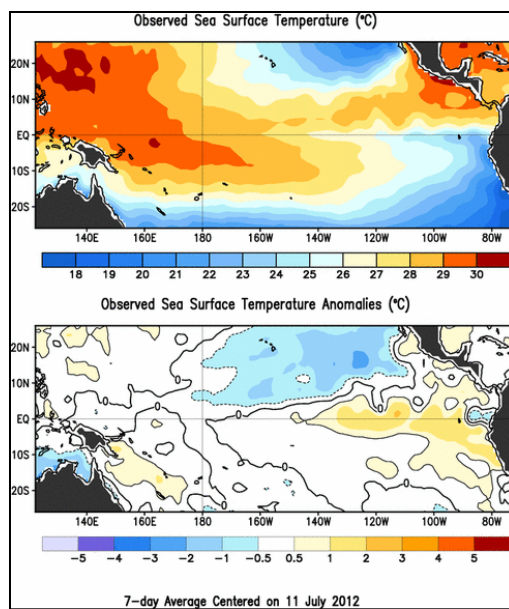
## Shortcuts to Forecast Discussions

[ENSO](#) | [Storminess](#) | [Rainfall](#) | [Temperature](#)

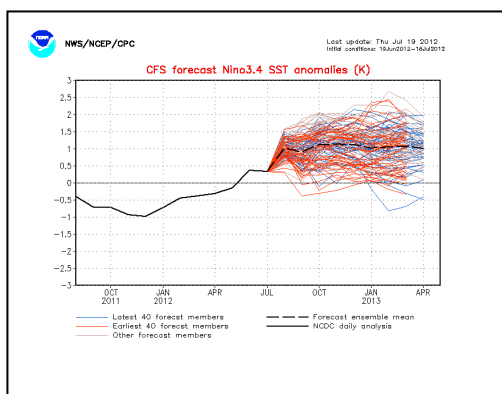
## About This Product

This forecast is a result of research from the NWS in Melbourne, Florida on the EL Niño-Southern Oscillation (ENSO) and its impact on Florida's dry season. This research, conducted since early 1997, was produced in recognition of the fact that climatic fluctuations on regional and global scales have been shown to have a profound impact on Florida's weather from season to season. The importance of seasonal forecasts continue to increase as Florida's growing population becomes more sensitive to extreme weather events every year. Due to this sensitivity there is a need to better understand seasonal variability and seasonal forecasting of weather-related hazards.

This page assimilates a variety of information on seasonal forecasts for Florida in an easy-to-use format in order to keep society better informed. The primary purpose is to increase situational awareness by serving as an early warning system for significant dry season climatic variability in Florida and has four main goals: 1) Provide a clearinghouse for official NWS and NOAA seasonal forecasts and outlooks for the Florida region. 2) Provide an easy method to monitor meteorological measurements of the progress of the dry season through links to official NWS products and locally-produced, graphical products. 3) Provide graphical dry season forecasts and localized meteorological interpretation of official forecasts, and 4) Provide educational material to help users such as emergency managers, planners, forecasters and the public to better understand the physical relationships between ENSO and Florida weather and the predictability of these relationships to better aid preparedness and mitigation efforts. Potential users of this forecast should read the [disclaimer](#) before proceeding.



Averaged sea surface temperature (SST) and anomalies ( $^{\circ}\text{C}$ ) for the week centered on 11 July 2012. Image from NOAA/NWS/CPC.



Ensemble forecast for sea surface temperature (SST) anomalies in the Niño 3.4 region from the NOAA coupled forecast system (CFS). Image from NOAA/NWS/NCEP.

## Latest ENSO Discussion:

The Climate Prediction Center (CPC) has issued an **El Niño Watch**. Details can be found in the latest CPC [Diagnostic Discussion](#).

The [weekly SST analysis](#) centered on 11 July shows warmer than normal SST over the eastern half of the equatorial Pacific (Niño 3.0 area) and near normal SST over the western half (Niño 3.4 area). Values for Niño 3.0 and 3.4 areas ([map of Niño areas](#)) for the week centered on 11 July were +0.8 and +0.4 respectively. SST has been above +0.5 in the Niño 3.0 area for almost a month, but remained near neutral in the 3.4 area. Most recent daily SST analyses have shown warming in the Niño 3.4 area and a weak El Niño is likely already underway.

The NOAA CPC CFS model for the [Niño 3.4](#) and [Niño 3.0](#) areas have been consistent in developing a moderate El Niño (values between +1.0 and +1.5) later this summer and continuing through the upcoming 2012-13 dry season. The consensus of the dynamic forecast [models](#) is for a borderline moderate El Niño while statistical models favor neutral conditions or a weak El Niño event. Most models now indicate a peaking of warm SST's during November or December that is more realistic than previous early peaks. It is now highly likely that an El Niño will develop; the question is the strength – weak or moderate? Based on the preponderance of guidance a borderline moderate El Niño of +1.0 is assumed for the Florida impact forecasts for the 2012-2013 dry season (November-April). A moderate El Niño typically has significant impacts on Florida dry season weather. Warmer SST's in the eastern Pacific (Niño 3.0) also typically have a greater impact on Florida than in the western Pacific so if the trend continues with warmer water in the east, impacts are more likely to be representative of a moderate event. Please refer to the [Storminess](#), [Rainfall](#) and [Temperature](#) sections for discussion on expected Florida impacts. **This forecast will be updated by September 15th.**

**Previous 2012-13 Forecast Discussions:** [June 2012](#)

Our research over the years has shown that other teleconnections such as the **North Atlantic Oscillation (NAO)**, **Arctic Oscillation (AO)**, **Pacific North American Oscillation (PNA)**, and **Madden-Julian Oscillation (MJO)** can play a major role in Florida Dry Season weather. Even when El Niño is moderate or strong these other teleconnections can act to enhance or suppress the impact of an ENSO, or cause extreme variability within the dry season on their own. Refer to our [2006](#) and [2007](#) research reports for background. There is also an hour-long recorded technical training session on the [physical relationship of ENSO to Florida weather](#) available.

For a more in depth discussion on ENSO and its effects on Florida dry season weather and climate see our [EL Niño-Southern Oscillation and Florida Educational Material](#). For a formal definition of El Niño and La Niña see CPC's FAQ on [What is El Niño and La Niña](#).

Related Links			
<a href="#">CPC Tropical Pacific SST Forecast</a>	<a href="#">CPC ENSO Diagnostic Discussion</a>	<a href="#">CPC Monthly Atmospheric &amp; SST Indices</a>	<a href="#">CPC Weekly ENSO Update Products</a>
<a href="#">CPC EL Niño/La Niña Page</a>	<a href="#">Latest Daily SSTs</a>	<a href="#">Summary of ENSO Models</a>	<a href="#">NOAA CFS Model</a>
<a href="#">Info on NOAA CFS Model</a>	<a href="#">BOM ENSO Wrap-up</a>	<a href="#">MEI ENSO Index</a>	<a href="#">Long-Lead Prognostic Discussion</a>
<a href="#">Univ. of Wisconsin Satellite Derived Winds &amp; Analyses for Eastern N. Pacific</a>	<a href="#">Ocean Winds from ASCAT Satellite</a>	<a href="#">NOAA Geostationary Satellite Server</a>	

## Storminess Discussion

This updated storminess forecast for the 2012-13 dry season is based on the assumption of a minimal moderate El Niño averaging +1.0 for OND and JFM. The June update was based on a minimal weak El Niño. A moderate El Niño typically brings more significant extratropical storms than normal to Florida with an increased risk of severe weather – especially during the traditional severe weather season of February through April (FMA). [Logistic regression guidance](#) for NDJ and FMA favors above normal storminess with a 51% chance for NDJ and a 70% chance for FMA. Based on the expectation of a moderate El Niño, above normal storminess is [forecast for the NDJ](#) period (2-4 storms) and [forecast for FMA](#) (5-7 storms) or 7 to 11 significant extratropical storms during the dry season (normal is 6). **This forecast will be updated by September 15th.**

November - January (OND NINO 3.4 1.0)				
Statewide Storminess				
	WBN	BN	AN	WAN
All	6%	21%	51%	30%
February - April (JFM NINO 3.4 1.0)				
	WBN	BN	AN	WAN
All	12%	20%	70%	33%

Logistic Regression Guidance for dry season storminess

Keep up to date with daily [Hazardous Weather Outlooks](#) out to 7 days for Florida from the NWS office responsible for your area. The NWS Melbourne office produces a daily [Graphical Hazardous Weather Outlook](#) for east central Florida in addition to the 7-day text product as do most Florida NWS offices. For longer range outlooks the Climate Prediction Center provides a [U.S. Hazards Assessment out to 2 weeks](#).

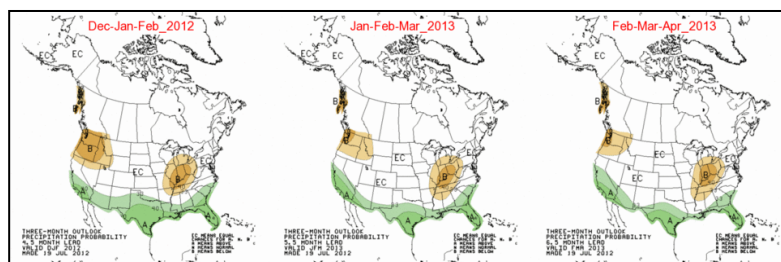
For a more in depth discussion on ENSO and its effects on Florida Storminess and Severe Storms check out our educational material on [EL Niño-Southern Oscillation and Florida Storminess](#) and on [EL Niño-Southern Oscillation and Florida Dry Season Tornadoes](#).

Major Dry Season Storms of 2012-2013		
Weather Map	Storm Reports	Storm Surveys

## Related Links

	CPC-NWS Suite of Official Forecasts	CPC 500mb Height Anomalies	CPC 200mb Height Anomalies	CPC 3-day IR Temperature Animation	NCEP 2-week 500mb Height Forecast Ensemble
Fronts day 3-7	MJO Monitoring	Arctic Oscillation	North Atlantic Oscillation	Pacific-North American Oscillation	NCEP Historical Analyses
	Storm Reports			Daily Weather Maps	CPC Storm Tracks
CDC 250mb Wind Animation	CDC Sea Level Pressure Animation	CDC 500mb Height Animation	CDC 7-day Average of 250mb Winds	CDC Outgoing Longwave Radiation	NCEP 2-week MSLP Forecast Ensemble

## Rainfall Discussion



The latest Climate Prediction Center's (CPC) precipitation forecasts for December through April.

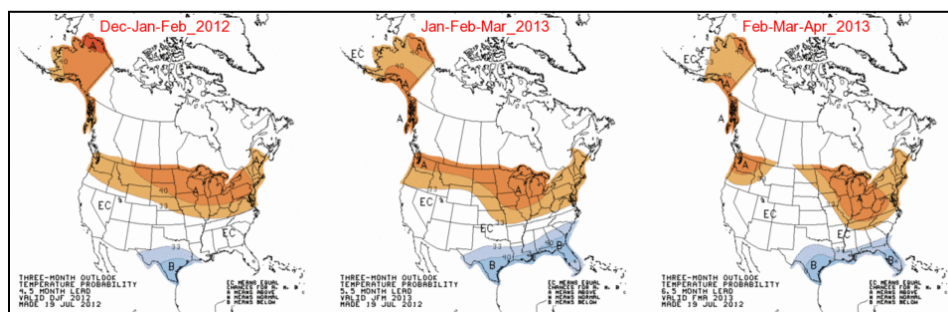
This updated rainfall forecast is based on the assumption of a minimal moderate El Niño averaging +1.0 for OND and JFM. A moderate El Niño typically brings wetter than normal conditions to Florida, indeed [Logistic regression guidance](#) for NDJ and FMA favors above normal rainfall for all [climate divisions of Florida](#) (50 to 70% range) with chances of well above normal rainfall generally in the 30 to 35% range. Based on the expectation of at least a low-end moderate El Niño the [forecast for the NDJ](#) and [FMA](#) periods is for above normal rainfall. The NWS [CPC forecast](#) is also for above normal rainfall for Florida next winter. **This forecast will be updated by September 15th.**

For a more in depth discussion on ENSO and its effects on Florida's Rainfall see our [Florida's Dry Season Rainfall and El Niño-Southern Oscillation Educational Material](#).

Monitor Latest Rainfall Trends			
City	Days into the Past		
Tallahassee	<a href="#">30</a>	<a href="#">90</a>	<a href="#">365</a>
Jacksonville	<a href="#">30</a>	<a href="#">90</a>	<a href="#">365</a>
Tampa	<a href="#">30</a>	<a href="#">90</a>	<a href="#">365</a>
Miami	<a href="#">30</a>	<a href="#">90</a>	<a href="#">365</a>
Orlando	<a href="#">30</a>	<a href="#">90</a>	<a href="#">365</a>

RELATED PRECIPITATION LINKS	
<a href="#">Climatological Data</a>	<a href="#">CPC U.S. Drought Assessment</a>
<a href="#">CPC 6-10 Day Rainfall Outlook</a>	<a href="#">Rainfall Analysis</a>
<a href="#">SERFC Water Resources Outlook</a>	<a href="#">CPC/NCEP 13 Month Seasonal Precip Outlook</a>
<a href="#">Southeast Climate Consortium</a>	<a href="#">SERCC Rain Perspectives</a>

## Temperature Discussion



The latest Climate Prediction Center's (CPC) temperature outlook for December through April.

This updated temperature forecast for the 2012-13 dry season is based on the assumption of a minimal moderate El Niño averaging +1.0 for OND and JFM. El Niño typically favors cooler temperatures, but there is not as reliable a response signal for Florida temperature compared to rainfall for this scenario as the [Arctic Oscillation](#) (AO) plays a big role in dry season temperature and is not predictable beyond a few weeks. A record negative AO brought much colder weather in 2010-11 and a persistent positive AO reinforced milder temperatures last dry season. Nevertheless, there is a definite ENSO signal that is not as strong early in the season as it is later in the season. [Logistic regression guidance](#) for NDJ is split between above and below normal chances and near normal temperatures are forecast, FMA guidance clearly favors below normal temperatures for all [Florida climate zones](#) (55 to 65% range). The [forecast for NDJ](#) is for near normal temperatures and the forecast for [FMA](#) is for below normal temperatures. The NWS [CPC forecast](#) is also for equal chances of above or below normal rainfall for the first half of the



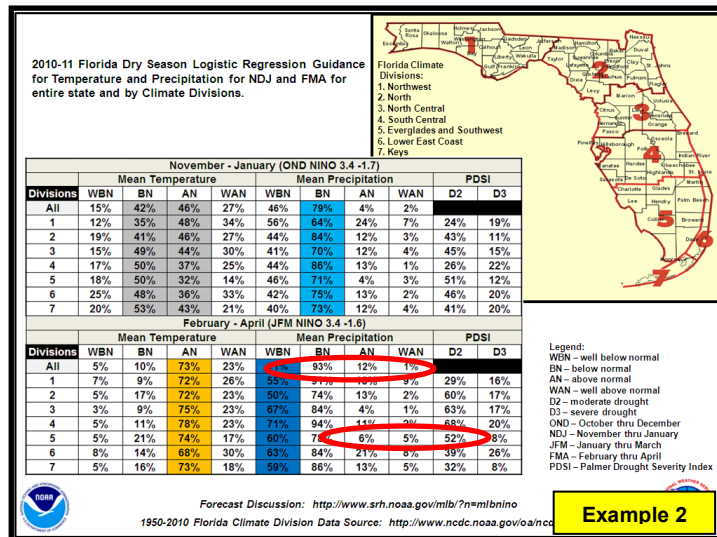
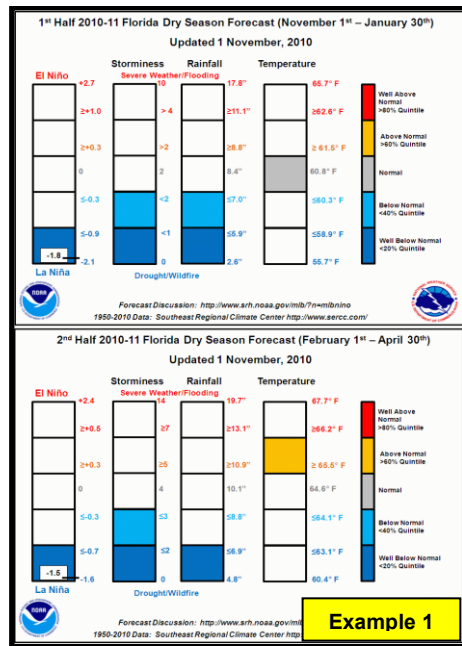
dry season and below normal for the second half. **This forecast will be updated by September 15th.**

RELATED TEMPERATURE LINKS	
<a href="#">Climatological Data</a>	<a href="#">CPC Temperature Outlooks</a>
<a href="#">CPC 6-10 Day Temperature Forecast</a>	<a href="#">Florida Climate Center</a>
<a href="#">SSD Daily Snow Cover Analysis</a>	<a href="#">CDC 7-Day Surface Temperature Anomalies</a>
<a href="#">NCEP Ensemble of Mean 850mb Temperature Anomalies</a>	<a href="#">SERCC Temperature Perspectives</a>

Monitor Latest Temperature Trends			
City	Days into the Past		
Tallahassee	30	90	365
Jacksonville	30	90	365
Tampa	30	90	365
Miami	30	90	365
Orlando	30	90	365



# How to Interpret the Florida Dry Season Forecast Charts



The Florida Dry Season Forecast (1 November through 30 April), first started in 2001, is intended to serve as an early warning of significant impacts from climatic variability for planners and decision makers. The ENSO signal (La Niña to El Niño) is the primary input to the forecast. The dry season forecast for the number of significant extratropical storms expected to impact Florida, average rainfall, and average temperature is divided into two three-month periods: November through January (NDJ), and February through April (FMA). The ENSO state is represented by the Niño 3.4 index averaged from October through December (OND) for the NDJ forecast values and January through March (JFM) for the FMA forecast values (a one-month lead).

The ENSO state and forecasts of storminess, rainfall and temperature are divided into 5 categories or quintiles: well below normal, below normal, normal, above normal, and well above normal. The historical ranges of values for each category are shown on the right side of the forecast bar charts and were computed from 1950-2010 data (temperature and rain data: Southeast Regional Climate Center <http://www.sercc.com/>; Niño 3.4 data: <http://www.cpc.noaa.gov/data/indices/sstoi.indices>; Storminess data is produced at NWS Melbourne Florida).

The potential impacts from extreme climatic variability of storminess and rainfall are indicated from drought and wildfire for well below normal to severe weather and flooding for well above normal. However, for temperature the risk of a devastating freeze is not well correlated with overall well below normal temperatures. Indeed, devastating freezes

are usually more likely during ENSO neutral conditions. The temperature forecast is thus intended to be used as a broad measure of temperature conditions. Likewise, due to their nature these statewide average forecasts are not applicable to a specific location and time within the dry season. For example, during a strong La Niña the threat of drought and wildfire is greatly increased in Florida. The associated negative rainfall and temperature impacts may not occur in every part of Florida, but it is highly likely they will impact some areas of Florida quite severely and the forecast for all of Florida serves as an early warning for planning and mitigation purposes.

The dry season forecast is shown using two separate charts, the first (example 1) provides a forecast for the entire state, while the second (example 2) provides logistic regression guidance for the entire state *and* its seven climate divisions.

**Example 1:** These charts illustrate the dry season forecast for the entire state of Florida, divided into two three-month periods. While the predicted Niño 3.4 value is the most heavily weighted component, these forecasts are a subjective synthesis of locally developed statistical guidance along with a variety of other observations and forecasts such as those linked to in this document and thus are the best predictions at the time issued in the professional opinion of the forecaster. The actual forecast for each element is indicated by the level of the colored bar from normal, either above (toward red) or below (toward blue) normal. For instance, below normal rainfall is forecasted for the NDJ period, however; guidance suggests well below normal rainfall for FMA.

**Example 2:** [Dry season logistic regression guidance](#) of temperature, rainfall and drought severity for Florida and its 7 climatic divisions are also provided for the NDJ and FMA periods for greater spatial detail. The logistical regression probabilities for each forecast element and category are shown on the chart as an objective decision aide. This guidance is also strongly considered in assigning the forecast categories to the [statewide forecast](#). Storminess is not included in this forecast as significant dry season storms typically impact large portions of the state, however associated severe weather and flooding may be very localized. Additional clarifying information will typically be included in the monthly updates and the forecast graph is meant to be used in concert with the related discussions within this document.

For instance, in the example chart from December 2010 for Division 3 for the FMA period (bottom chart) the subjective forecast of Niño 3.4 for JFM is -1.6 (strong La Niña). Based on this value there is a 67% chance of rainfall being well-below normal and an 84% chance of below normal rainfall for Division 3. Probabilities of above normal and well above normal are 4% and 1% respectively. The probabilities for each element do not add up to 100%; each quintile category is a separate forecast of dichotomous

conditions. In other words a 60% chance of well-below normal means that there is a 40% chance of greater than well below normal and so on. The color-coded forecast quintiles from the statewide forecasts are indicated on the objective guidance table as a cross reference.

The discussions will address the issue of uncertainty and other factors and should be used to supplement the forecast charts. The first long-range forecast of the upcoming dry season is released in June and the Niño 3.4 values are based entirely on long-range forecasts in monthly updates through September. The most critical forecast released around November 1<sup>st</sup> for the start of the dry season contains the actual Niño 3.4 value for October and forecasts for the following months. The forecast is updated throughout the dry season, but its value as an early warning device diminishes as the season progresses.

For a more in depth information on ENSO and its effects on Florida dry season weather and climate see our [EL Niño-Southern Oscillation And Florida Educational Material](#) and the references below.

**Forecast Questions:** [Bart.Hagemeyer@noaa.gov](mailto:Bart.Hagemeyer@noaa.gov)

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## Disclaimers:

This web page has four main goals: **1)** Provide a clearinghouse for official NWS/NOAA seasonal forecasts and outlooks for the Florida region. **2)** Provide an easy method to monitor meteorological measurements of the progress of the seasons through links to official NWS products and locally-produced, graphical products. **3)** Provide graphical dry season forecasts and localized meteorological interpretation of official forecasts, and **4)** Provide educational material to help users such as emergency managers, planners, forecasters and the public to better understand the physical relationships between ENSO and Florida weather and the predictability of these relationships to better aid preparedness and mitigation efforts.

The achievement of these goals involves the development of graphical products, interpretative adaptive forecasts and educational material that each have some component of risk that should be understood by users.

**Goal 1** is met by linking to information from official NOAA/NWS sources, primarily the Climate Prediction Center (CPC) and users should review the disclaimers associated with these products on the CPC web site and base their risk of use from information contained there. **Risk of use - Low**.

**Goal 2** is met by providing links to official climate monitoring information and by providing locally developed graphics so that users can monitor the progress of the seasons versus normal and assess the progress of the forecasts. The monitoring graphics do not contain any forecast components and are constructed using official data; however, errors could arise during data processing and plotting of these products. In addition, the quantities represented are in some cases a synthesis of various meteorological parameters and calculations and an understanding of what they represent is necessary for proper interpretation. **Risk of use - Low**.

**Goal 3** is met by providing products intended to forecast selected mean atmospheric conditions and accumulated atmospheric phenomena over the breadth of Florida and the adjacent northeast Gulf of Mexico and the span of the 6-month dry season. Three forecast product groups are produced: 1) a Graphical Seasonal Outlook - a summary of ENSO, Storminess, Precipitation, and Temperature outlooks that are an adaptive blend of seasonal forecasts and official forecasts, 2) a textual seasonal forecast discussion that expands on the reasoning behind the Graphical Seasonal Outlook, and 3) raw dry season forecast parameters presented as time series of actual values versus predicted values. Their purpose is to provide a representation of statewide/regional meteorological impacts expected from 1 November to 30 April each dry season relative to normal to provide early warning of significant climatic extremes to increase situational awareness. Users should keep abreast of the day-to-day hazardous weather threats within a season by referring to NWS Graphical Hazardous Weather Outlook pages: [Melbourne](#) [Key West](#) [Miami](#) [Tampa](#) [Jacksonville](#) [Tallahassee](#) [Mobile](#).

Extreme weather events can occur within the forecast area and have significant local impacts even though the seasonal measures forecast here are not extreme. For example, record breaking rainfall could occur over an area of, say, several counties, while the broader forecast area remains in serious long-term drought. Likewise, a singular extreme weather event such as the "Superstorm" of March 1993 could occur and cause widespread destruction and human impact within an otherwise quiescent season. Potential users should review all of the linked supporting educational material to better understand the forecast process, confidence factors, and assumptions of physical relationships between ENSO and Florida weather before proceeding:

[EL Niño-SOUTHERN OSCILLATION \(ENSO\)](#)   [STORMINESS](#)   [SEVERE STORMS](#)

[PRECIPITATION](#)

[TEMPERATURE](#)

The seasonal forecasts employ multiple linear regression and logistic regression techniques and are based on the official observed and forecast Niño 3.4 and 3.0 values from the CPC and historical weather data for the Florida region. Serious errors can arise from the fact that the predictive equations are based on CPC forecasts of Niño 3.4 and 3.0 as much as 12 months in advance. The accuracy of these forecasts will have a bearing on the accuracy of the regression equations. ENSO is the dominate environmental factor in dry season weather extremes in Florida, but it is not the only factor. Forecast verification is generally quite good for well developed moderate to strong La Niña/El Niño trends. The multiple linear/logistic regression equations do not fully account for all the variability in the atmosphere, and can have significant deviation from reality in some seasons when the ENSO signal is weak or near neutral. Other phenomena such as the North Atlantic Oscillation (NAO), Arctic Oscillation (AO) and Pacific-North American (PNA) Oscillation may play important roles in some years, and these are neither well understood nor currently forecast at long range. Our [\*\*research reports\*\*](#) provide more background on these oscillations and issues of predictability.

There is a well-documented concern of providing decision makers with too many forecasts or with competing/conflicting forecasts from which to choose. A serious attempt has been made to address these concerns. These forecasts are meant to supplement - not replace - the official NWS CPC seasonal and winter outlooks by providing more detail and adaptive meteorological interpretation of the impact of predicted climatic events on the Florida region. Generally, due to the nature of the forecast it will fall within the general boundaries of the official temperature and precipitation forecast. However, the forecasts of severe weather and storminess fall outside the traditional realm of seasonal forecasting and may be considered controversial. **Risk of use – Low in well-developed EL Niño/La Niña conditions and low to moderate in neutral or very weak ENSO conditions.**

**Goal 4** is met by providing customized educational information on Florida seasons, the physical relationships between ENSO and Florida weather, and the predictability of



these relationships. This information is generally in a constant state of review and update and should be considered a work in progress. Research continues at a rapid pace around the globe on the impact of ENSO and other climatic forces and it is nearly impossible to keep up with the latest breaking research. The information contained here, although presented in one form or another at various American Meteorological Society and National Weather Association Conferences and Symposia and published in Preprint volumes of their proceedings, has not been subject to formal peer review and may be controversial and contrary to other research results. **Risk of use – Low.**

This page is intended to be updated monthly after the preceding month's data and updated CPC ENSO forecasts are available. There is no guaranty that this page will be updated in a timely manner due to higher priority duties or other circumstances beyond our control or that this page will continue to be able to be maintained.

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Date Updated: July 22, 2012

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